Sentinels for a More Resilient Coast
How Sentinel Sites Connect Local Sea Level Rise and Coastal Change Science to Regional Decision-making

Sarah Wilkins, Maryland Sea Grant Extension
Restore America’s Estuaries National Summit
December 13, 2016
Cross-cutting Objectives

- INCREASE understanding of sea level rise impacts on coastal ecosystems through Cooperative research and monitoring
- IMPROVE science-based capabilities and capacity
- CONDUCT outreach to coastal communities regarding impacts
- SHARE best practices and available science to guide decision-making at local and regional scales
- BUILD, ENHANCE and EXPAND partnerships
Global warming is the **primary cause** of current sea level rise.

**Temperatures Are Rising**
Heat-trapping gases from human activity have increased global average temperatures by 1.4°F since the 1880s.

**Oceans Are Warming**
Sea water expands as its temperature rises.

**Ice Is Melting**
Shrinking glaciers and ice sheets are adding water to the world’s oceans.

Credit: Union of Concerned Scientists

NOAA Sentinel Site Program
Local sea level rise is the result of several processes:

- Global sea level rise
- Land motion
- Oceanic and Atmospheric dynamics

Source: Canadian Geodetic Survey, Natural Resources Canada

NOAA Sentinel Site Program
How does local sea level rise impact the coast?

- Increased coastal erosion
- Increased saltwater intrusion
- Increased damage from storm surge
- Increased frequency of tidal flooding
Sentinel Sites: Local Responses to global change

NOAA Sentinel Site Program

Science
- Observe & Monitor
- Applied Research
- Models & Predictions

Service
- Spatial Analysis & Visualization
- Information Transfer

Stewardship
- Management & Decision Making
- Education & Outreach
Sea Level Rise

Upland

Bench Mark with Geodetic Control (NAVD88, etc.)

Surface Elevation Table (SET)

Tide Gauge

Total Local Inundation

Wetland Subsidence

SET Wetland Bench Mark

Courtesy of Philippe Hensel, NOAA National Geodetic Survey
Sentinel Site Cooperative Partners

Chesapeake Bay

North Carolina

Hawaiian Islands

Northern Gulf of Mexico

San Francisco Bay

NOAA Sentinel Site Program
North Carolina
Sentinel site research supports the development of living shorelines policy
North Carolina
Sentinel site research supports the development of living shorelines policy

Response of salt marshes to wave energy provides guidance for successful Living Shoreline Design
Currin, Davis & Malhotra
CRC Press 2017

Science  Policy & Management  Education & Outreach

Coastal Training Program Workshops for Contractors and Realtors

Demonstration Projects

NOAA Sentinel Site Program
Chesapeake Bay
Connecting the “dots” across Bay wetlands
Chesapeake Bay
Working hand-in-hand with emergency managers to install gauges in critical areas

Figure 10. NWLON gaps analysis for the northern Chesapeake Bay
Northern Gulf of Mexico
Inventories for strengthened decision-making

RAE-TCS Poster Session
Renee Collini
Poster #STP104

NOAA Sentinel Site Program
Northern Gulf of Mexico
Inventories for strengthened decision-making

Figure 1. An example of co-located CORS and NWLON station at Crescent City, CA. Photo Credit NOAA COOPS

www.ngomssc.org -> Gulf SLR Assets page

NOAA Sentinel Site Program
San Francisco Bay

Bridging Natural and Built Adaptation Planning

NOAA Sentinel Site Program
San Francisco Bay
Bridging Natural and Built Adaptation Planning
Hawaiian Islands
Using citizen science to document high water levels

King Tides

NOAA Sentinel Site Program
Hawaiian Islands
Using citizen science to document high water levels

"Snap the Shore, See the Future"
International King Tides Project
Thank you!  Questions?

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